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MEMORANDUM

To: Bonnie Lavelle
 From: Adrian Bradley, Bill Brattin
 Date: November 5, 1999
 Project: Vasquez Boulevard & I-70
 RE: Sources of standards for vegetable analysis

ISSI Consulting Group, Inc. (ISSI) has confirmed the availability of the following certified standard reference materials that can be used in the analysis of vegetable material. These standards are available from the National Institute of Standards and Technology (NIST) Standard Reference Materials program.

<u>Material</u>	<u>Unit Size</u>	<u>As certified value</u>	<u>Pb certified value</u>
Apple Leaves	50g	0.038 mg/kg	0.470 mg/kg
Peach Leaves	50g	0.060 mg/kg	0.87 mg/kg
Spinach Leaves	60g	0.068 mg/kg	0.20 mg/kg
Tomato Leaves	50g	0.112 mg/kg	value not listed

Standard Reference Materials have been certified for use in testing the reliability of analytical methods for the determination of major, minor, and trace elements in botanical materials, agricultural food products, and materials of similar matrix. Certified values are equally weighted means of the results of two or more different analytical methods. Each shipment is accompanied by information on the analysis results, preparation instructions, recommended storage conditions, and a description of the methods used in the preparation of each material.

Please feel free to contact me if you have any questions or would like further information.


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110.4 Agricultural Materials (powder form)

D - View Detail **C** - View Certificate **M** - View MSDS

	D C	D C	D C	D C	D C	D C	D C	D C	D C	D C	D
SRM Type	1515 Apple Leaves	1547 Peach Leaves	1570a Spinach Leaves	1573a Tomato Leaves	1575 Pine Needles	2695 Fluoride, in Vegetation	RM 8030 BCR No 60 Aquatic Plant	RM 8031 BCR No 61 Aquatic Moss	RM 8412 Corn Stalk (Zea Mays)	RM C Ke M	
Unit Size	50 g	50 g	60 g	50 g	70 g	2 x 25 g	25 g	25 g	34 g	4	

Element (Concentrations are in mg/kg, unless noted by a single asterisk for mass fraction, in %)

Aluminum	286	249	310	598	545						(
Antimony	(0.013)	(0.02)		0.063	(0.2)						
Arsenic	0.038	0.060	0.068	0.112	0.21						
Barium	49	124		(63)							
Boron	27	29	37.6	33.3							
Bromine	(1.8)	(11)		(1300)	(9)						
Cadmium	(0.013)	(0.026)	2.89	1.52	(< 0.5)		(2.20)	(1.07)			
Calcium	1.526*	1.56*	1.527*	5.05*	0.41*				(0.216*)		(
Cerium	(3)	(10)		(2)	(0.4)						
Cesium				(53)							
Chlorine	579	360		(6600)					(0.244*)		(4
Chromium	(0.3)	(1)		1.99	2.6						
Cobalt	(0.09)	(0.07)	0.39	0.57	(0.1)						
Copper	5.64	3.7	12.2	4.70	3.0		(51.2)	(720)	(8)		(
Europium	(0.2)	(0.17)	(0.0054)		(0.006)						
Fluorine						64 / 277			(0.65)		(0
Gadolinium	(3)	(1)		(0.17)							
Gold	(0.001)										
Hydrogen		5.2*									
Iodine	(0.3)	(0.3)		(0.85)							
Iron	(83)	(218)		368	200				(139)		(
Lanthanum	(20)	(9)		(2.3)	(0.2)						

Lead	0.470	0.87	(0.20)	10.8	(63.8)	(64.4)		
Magnesium	0.271*	0.432*	(0.89*)	(1.2*)			(0.160*)	(0.0)
Manganese	54	98	75.9	246	675	(1759)	(3771)	(15)
Mercury	0.044	0.031	0.030	0.034	0.15	(0.34)	(0.23)	
Molybdenum	0.094	0.060		(0.46)				
Neodymium	(17)	(7)						
Nickel	0.91	0.69	2.14	1.59	(3.5)			
Nitrogen	2.25*	2.94*	5.90*	3.03*	(1.2*)		(6970)	(13)
Phosphorus	0.159*	0.137*	0.518*	0.216*	0.12*			
Potassium	1.61*	2.43*	2.903*	2.70*	0.37*		(1.735*)	(0.)
Rubidium	10.2	19.7	(13)	14.89	11.7			
Samarium	(3)	(1)		(0.19)				
Scandium	(0.03)	(0.04)	(0.055)	(0.1)	(0.03)			
Selenium	0.050	0.120	0.117	0.054			(0.016)	(0.)
Sodium	24.4	24	1.818*	136				(28)
Strontium	25	53	55.6	(85)	4.8			(12)
Sulfur	(0.18*)	(0.2*)	(0.46*)	(0.96*)				
Tellurium								
Terbium	(0.4)	(0.1)						
Thallium					(0.05)			
Thorium	(0.03)	(0.05)	0.48	(0.12)	0.037			
Tin	(< 0.2)	(< 0.2)						
Tungsten	(0.007)							
Uranium	(0.006)	(0.015)	(0.15)	(35)	0.020			
Vanadium	0.26	0.37	0.57	0.835				
Ytterbium	(0.3)	(0.02)						
Zinc	12.5	17.9	82	30.9		(313)	(566)	(32)

Values in parentheses are not certified and are given for information only.